

# DOCKETED

IN THE UNITED STATES DISTRICT COURT FOR THE  
SOUTHERN DISTRICT OF NEW YORK

MIDWAY MANUFACTURING COMPANY:

Deposition of

vs.

:

William T. Rusch

THE MAGNAVOX COMPANY

:

Fifth Day

and

:

74 Civ 1657 CBM

SANDERS ASSOCIATES, INC.

:

IN THE UNITED STATES DISTRICT COURT FOR THE

NORTHERN DISTRICT OF ILLINOIS, EASTERN DIVISION

THE MAGNAVOX COMPANY, et al :

Consolidated Actions

vs.

:

74 C 1030✓

74 C 2510✓

BALLY MANUFACTURING  
CORPORATION , et al

:

75 C 3153

75 C 3933

Deposition taken pursuant to

subpoena and notice at Sanders Associates, Inc.,

Headquarters, Spit Brook Road; Nashua, New Hampshire;

Tuesday, March 9, 1976; commencing at ten o'clock in the  
forenoon.

FILED

OCT - 8 1976

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U.S. DISTRICT COURT, DISTRICT OF  
NEW HAMPSHIRE, NASHUA

ORIGINAL

PRESENT:

For Midway Manufacturing Company,  
Bally Manufacturing Corporation  
and Empire:

Donald L. Welsh, Esq., 135 South  
LaSalle Street, Chicago, Illinois

For Atari, Inc.: present will

Flehu, Hohbach, Test, Albritton &  
Herbert, by Edward S. Wright, Esq.,  
160 Sansome Street, 15th Floor,  
San Francisco, California.

For Sanders Associates, Inc., and  
Magnavox Company: present will

James T. Williams, Esq., 77 West  
Washington Street, Chicago,  
Illinois.

For Sanders Associates:

Louis Etlinger, Esq., and  
Richard I. Seligman, Esq.,  
Daniel Webster Highway, South,  
Nashua, New Hampshire

Stenotype Reporter:

Ronald J. Hayward

WILLIAM T. RUSCH

called as a witness, having been previously sworn, was  
further examined and continued his testimony as follows:

(Interrogatories by Mr. Welsh.)

Q. Mr. Rusch, when we last met, you were going through

Mr. Harrison's notes to determine, if you could, when the concept of wall bounce was implemented in circuitry. You had gotten to Exhibit 139 and 140, pages 139 and 140 of Exhibit 23; and with respect to Exhibit 139, I believe you stated that that may have been an attempt to implement wall bounce, but you did not see gates to change the polarity when the wall was hit. Then you referred to Exhibit 23-140 indicating some of the notes may have been in your handwriting. I wonder if you could go on, please, in this notebook or this group of notes of Mr. Harrison's and advise us whether you find anything else that indicates implementation of the wall bounce feature?

- A. 23-141 looks like a piece of paper - I think that is my handwriting, the whole thing. I see a differentiator and a gate and an integrator.
- Q. Do you see there the gate to change polarity when a wall is hit?
- A. I don't think so. I see what could be one gate and the word gate written up at the top of the page.
- Q. What is the purpose of that gate?

MR. WILLIAMS: If you recall,

Mr. Busch. 11?

THE WITNESS: I am not sure  
right now. I don't believe this document

Q. Going on, these notes of Mr. Harrison's, can you  
find anything which indicates that wall bounce has  
been implemented? what his recollection of the facts

A. Possibly at the bottom of 23-142, I see what might  
be a double gate. I am not sure of that, even. It  
will take me a little while to get back into the  
swing of this. On 23-143, I see what might be the

Q. same sort of gate as on the previous exhibit in

A. the lower corner with the label A, B, C and D.

Q. Whether or not that is the gates associated with  
the wall bounce, I am not sure. MS: You mean what

Q. Have you passed Exhibit 23-147? I mean to the

A. Yes, who authored the document? MS: 23-147

Q. Do you see any reference to wall bounce on that  
exhibit?

A. I would imagine the arrows up in the figure labeled  
"hockey" and the words "attempted circuitry for  
banked shots referred to wall bounce.

Q. Does that indicate a successful attempt or  
assumption.

Q. unsuccessful? Assume?

A. Properly what you would MR. WILLIAMS: Well, I object to the question, I don't believe this document was offered by Mr. Rusch and whether it indicates a successful or unsuccessful attempt to him is

Q. irrelevant as to what his recollection of the facts

A. were as they occurred, but you may answer the question, Mrs. Rusch except the date, the name, hockey, and I would THE WITNESS: This by itself

I don't think indicates a successful attempt.

Q. Does the page contain any X-ing out of any parts?

A. Yes, there anything else specifically X'ed out on

Q. Do you know what that X-ing out means?

A. The sentence seems to MR. WILLIAMS: You mean what

Q. it means to him or what it possibly meant to the

A. person who authored the document? invert voltages

Q. Do you know what it meant to whoever put the X on it? down effects."

A. I don't know for sure, no. by upside-down effects?

Q. Do you know whether Mr. Harrison had any practice with respect to X-ing out circuits? was meant at the

A. I don't remember for sure. I could make an assumption. at now? I think the question is vague.



Q. What would you assume ? MR. WILLIAMS: I can't say for

A. Probably what you would - well, I can't say that, but  
can I. I would assume that possibly for one reason  
or another this may not have been a final successful  
attempt at wall bounce. 11 bounce.

Q. What is X'ed out on the page? exhibit 19 and page 3

A. I assume this big X is probably meant to include  
everything on the page except the date, the name,  
hockey, and I would assume it didn't mean the

A. diagram at the top which still looks like we were  
attempting to do. hanging the polarity of the

Q. Is there anything else specifically X'ed out on

Q. the page? as to page 14 of exhibit 19 and the words

A. The sentence seems to be X'ed out, you look at those

Q. What is that? as to whether they deal with any

A. It says, "It will be necessary to invert voltages

A. to appropriate section of joy stick to eliminate

Q. upside-down effects." see pages - first of all,

Q. Do you know what is meant by upside-down effects? that

was referred to by MR. WILLIAMS: Again I object

Q. to the question, do you mean what was meant at the

time that the document was written or do you mean

what is meant now? I think the question is vague.

Q. could you perhaps in THE WITNESS: I can't say for sure. There may be a tie-in with one of the comments I think in my notebook covered last time. There was some problem, as I recall, of the voltage being the wrong polarity after wall bounce.

Q. Referring to your notebook, Exhibit 19 and page 3 and the following pages, do they relate or contain entries which relate to the problem which you just referred to? I guess it starts on page 2.

A. I would say the comments on these pages do seem to be addressed at changing the polarity of the voltage when the wall is hit and get bounce - then

Q. I refer you to page 14 of Exhibit 19 and the pages that follow up to page 23, would you look at those and advise us as to whether they deal with any of the wall bounce problem? It was and was not part of the

A. Certainly some of them do, yes.

Q. Would you look at those pages - first of all, yes, can you tell us what the wall bounce problem was that was referred to on those pages?

A. I can't do that from memory, I can quote the bottom of page 14 of this exhibit, which says, "Problem with wall bounce."

- Q. Could you perhaps look at these pages and refresh your recollection as to what that problem was?
- A. I think it goes on to at least page 23. I asked that you take some time to look at that to refresh your recollection, as to have still been in
- A. Apparently the problem was, as stated on the bottom of page 14 and 16. For some reason, it seemed like it must have been that the ball was hit down and it would go up instead. WILSON: Could you read the
- Q. Would you quote the part that appears under the note, problem with wall bounce, on page 14?
- A. "If hit up toward top wall and get bounce - then due to the slope reversal of ball control, must hit down to make ball go up. This is N. G. for ping pong, hockey, etc." N. G. meaning no good. The latter was added right now and was not part of the quote. 7 on page 16 of Exhibit 19 and there is some
- Q. Now, these notes in this notebook are your notes, are they not? polarity going to integrator as had
- A. Yes, all - so if hit ball up, it will go up (not
- Q. Having refreshed your recollection, do you recall that wall bounce problem? as on the following pages
- A. Not specifically, relating to the wall bounce problem.



Q. Do you recall whether it was ever solved?

A. Yes, I know it was. I don't know of the

Q. Could you tell us by referring to your notes or Mr. Harrison's as to when and how the problem was solved? It appears to have still been in the overall existence as of December 7, '67, or the date of it Exhibit 23-147, does it not? I didn't see the flip-flop

A. Would you repeat that, please, I was reading? I was

goes up." MR. WELSH: Could you read the

question back? Just a note as to a possible solution

or do you know that that was actually implemented

(Whereupon, the previous and shown to work?

question was read back by

A. I know something was implemented; I don't recall the reporter.)

whether it was this specific thing we see right

here, but I do see it. THE WITNESS: That is correct.

It appears that it might have been solved on a level.

12-11-67 on page 16 of Exhibit 19 and there is some wall? 5/28/76

writing in my handwriting which says, "When ball

stops, set up polarity going to integrator as had

A. initially - so if hit ball up, it will go up (not

Q. down)." by the bottom of the edge?

Q. Now, there are other entries on the following pages of your notebook relating to the wall bounce problem,

wall?

are there not?

A. In the overall problem, yes; I don't know offhand whether it refers to this particular part of that problem again. There is a note at the bottom of page 18 which would indicate that part of the overall problem had been solved. Next to a blue star it says, "Whenever hit ball with paddle, set the flipflop to plus one position, so when hit up, ball always goes up."

Q. Now, is that just a note as to a possible solution or do you know that that was actually implemented and shown to work?

A. I know something was implemented; I don't recall whether it was this specific thing we see right here, but I do definitely know that this minor problem was solved and that wall bounce was achieved.

Q. Now, you are speaking of ball bounce here, does that include as you are using it, bounce off any edge of the screen?

A. Yes.

Q. Including the bottom or top edges?

A. Yes.

Q. Is it possible that you were able to implement that

wall?

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ball bounce only from, say, a single vertical wall image on one edge of the screen?

A. No.

Q. You actually implemented the concept of wall bounce from a horizontal line or top to bottom edge of the screen?

A. What do you mean by horizontal line?

Q. Either an image of a horizontal line on the top or bottom edge? at the top and bottom edges of the screen?

A. I am sure that it was implemented off the top and bottom edges and the left and right edges and, as I say, it is quite probable that it was implemented off of generated lines.

MR. WELSH: Can you read the last part of that answer, please?

(Whereupon, the previous answer was read back by the reporter.)

Q. Are you familiar with the first model of the Odyssey which was manufactured and sold by Magnavox?

A. Not very. I have seen a few of them, but I am not

really that familiar with them.

Q. Are you familiar with the model of the Odyssey as it was used to play hand ball?

A. Not by any means as familiar as I was with the things we did in the room here at Sanders. I saw an Odyssey once done in New York City when I was on a business trip. That is the first time that I ever saw one, to my recollection. It was in a locked store at night; and since that time I think I saw one in a store here in Nashua. I have seen their TV ads through the years and one night at Mr. Baer's house I saw an Odyssey.

Q. Do you recall whether any of those Odyssey games that you saw included wall bounce?

A. I don't recall. There probably might have been in that hand ball game you mentioned, but I don't really recall. I seem to recall the ping pong game, the ball was hit from one paddle to another, but I don't remember anything further than that right now.

Q. Could you go now and tell us whether you find anything in either your notebook or Mr. Harrison's notes that indicate when circuitry for receiving the

wall bounce without the problem indicated in your notes was actually built and tested?

A. Exhibit 23-151 appears to be an implementation of the block diagram on page 18 of Exhibit 19. Both exhibits entitled "wall bounce." Both are dated 12-11-67.

Q. Can you tell from Exhibit 23-151 what wall bounce is implemented there? Are you referring to the left and right sides or the top and bottom specifically?

A. I can't tell for sure, but electronically when you have solved the problem for one of them, you have solved it for four. I don't recall.

Q. Doesn't bounce off of the top and bottom edge have some relation to the English control of the ball?

A. No, I don't think so.

Q. How about the bounce off the left and right edges?

A. If what I just said is true for top and bottom, it is also true for left and right.

Q. With the English control, the players are not able to move the ball left and right, are they?

A. It depends how it is implemented. It could be used for left and right motion just as well as up and down.



Q. But was it not limited to up and down?

MR. WILLIAMS: I object to the question. When was it limited to up and down?

MR. WELSH: Any time.

MR. WILLIAMS: I object to the question as vague.

THE WITNESS: I think in some of the specific games such as the ping pong game, it was used for up and down position. Electronically there is no reason for it not to be used for it other than we may have used that for that somewhere in the development, I don't recall. It is a matter of interconnecting two wires, probably.

Q. And was there not in the vertical English control a flipflop which when it changed conditions resulted in transfer of control from one player to the other?

MR. WILLIAMS: Again I object to the question as being vague as to time. You say in the English control was there not a flipflop, there may have been many implementations of the English control and I think you should tie it down more specifically in time.

THE WITNESS: I don't know.

I am quite sure wall bounce was implemented and could occur independently of English control as is seen on some of the sets one sees sitting around malls and places in the country where a ball just keeps bouncing from the four walls without any human standing near it. We had provision for that same thing, <sup>we</sup> not tied specifically to English control.

Q. Could you point out in these documents anything that indicates such implementation?

A. Well, on page 18 of Exhibit 19 seems to be general enough to substantiate what I just said in that two inputs appear to be horizontal control voltages and a vertical control voltage and these voltages could be implemented in many different ways. They could be from a so-called English control where a human would move a potentiometer. They could certainly be implemented with flipflops which would have a ball move continually left and right and/or up and down or random voltages could be fed to those terminals which would make the ball move in a random fashion. Irregardless of how these voltages are generated, whenever the ball hit the top, left -

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excuse me, top-bottom, left-right of the screen,  
a bounce would occur.

Q. You said Exhibit 23-115 represents implementation of that circuitry or block diagram of Exhibit 19-18, can you tell from Exhibit 23-151 whether wall bounce was obtained with that circuitry off the top and bottom edges or right and left edges or all four edges?

A. As I said before, I can't tell specifically as the circuit stands, it would provide for bounce from a pair, either left and right or top and bottom, but then a similar circuit would take care of the other two edges.

Q. Does the circuitry of Exhibit 23-151 have any relation to that of Exhibit 23-152?

A. Yes. Are you referring to...

Q. What is the relationship?

A. Well, substantial parts of both exhibits appear similar.

Q. Does the circuitry of Exhibit 23-152 include anything not in Exhibit 23-151?

A. Yes. As I said before, there is a...

Q. What? It also solves...

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clarity

- A. I see some point 1 microfarad capacitors in the flipflop of 23-152 that don't appear in 23-151.
- Q. Where is that flipflop?
- A. More or less in the middle of the page. On 23-151, it is comprised of two transistors with 510 K resistors going from collector to base and 10 K collector resistors.
- Q. Do you know what is the function of that flipflop?
- A. Yes.
- Q. What?
- A. I believe it is to change the polarity of the voltage going to the integrator when the edge is hit, similar to the functions shown on page 18 of Exhibit 19 by the boxes labeled horizontal FF and vertical FF.
- Q. The one you were referring to, there is only one of those, is there not?
- A. Correct.
- Q. Do you know which? That is, whether it is vertical or horizontal?
- A. I don't really see anything to indicate which, but, as I said before, solving the problem for one pair also solves it for the other pair.

Q. Well, would that flipflop which you described is it for either vertical or horizontal, is there another flipflop provided for the other one?

A. Eventually there was; I don't see them right on these particular pages. Well, I will put it this way, in Harrison's exhibit of the pages we have covered, to wit, 23-151 and 23-152, I don't see the provision yet, but on page 18 of Exhibit 19, the function is shown loud and clear in blue ink for both horizontal and vertical pairs.

Q. Do you find in any subsequent pages of Mr. Harrison's notes, Exhibit 23, any indication of further work regarding the wall bounce?

A. I'd say yes. At least on Exhibit 23-157, it appears to be some more work on the differentiator part of this circuitry. And it looks like two gates are shown in the upper right of that figure again.

Q. Did the intervening pages, 23-153, 54, 55 and 56, have anything to do with the wall bounce implementation?

A. I don't know about 23-153.

Q. Do you know what that circuitry at the top and the notation regarding the problem relates to?



- A. Not really.
- Q. Could you go on, then, with respect to other pages, 154, 55 and 56 regarding whether they relate to the wall bounce implementation?
- A. I would think the top of page 23-154 is still referring to implementation of the dates shown by the plus 1's and minus 1's on page 18 of Exhibit 19. And at the bottom of that Exhibit 23-154, there is still some notes about integrators which I assume to be the integrator shown on page 18 of Exhibit 19.
- Q. Would you go on?
- A. Exhibit 23-155 is still talking about integrators which I assume to be the same ones we have been talking about.
- Q. You are not sure, however?
- A. I am quite sure.
- Q. On the exhibit is the notation integrator memory is not adequate, do you know what was meant by that?
- A. Not specifically, no.
- Q. Do you have any idea?
- A. Just the sentence underneath the figure there where it says, due to the random change from inverting to

noninverting operation makes the memory more difficult to obtain. I think we were trying to possibly get this stretching and slowing action that is shown on page 19 of Exhibit 19.

Q. What do you mean by stretching and slowing action?

A. I believe I mean what is implied or written on page 18 of Exhibit 19 where it says "note - integrating this also has ball roll to gradual stop! "

Q. How was that involved with wall bounce?

A. I'd say it looked like we were trying to do several things at the same time. One of which was the wall bounce. The other apparently was trying this feature of having the ball roll to a gradual stop.

Q. But this matter of the integrator memory, that is directly related to wall bounce?

A. That is a hard question. It was certainly one way of providing a voltage which would keep a spot moving after a wall was hit as well as before. And this feature of the ball either stopping or slowing down to a gradual stop would appear to be related to the time constant incorporated into that integrator.

MR. WELSH: Why don't we take

a five-minute break.

(Whereupon, a recess  
was taken.)

Q. Would you go on, please, Mr. Rusch, with respect to Exhibit 23-156 and advise us whether that has any relation to wall bounce?

A. This seems to be a further attempt to improve the integrators of page 18 of Exhibit 19.

Q. I believe you stated that Exhibit 23-157 also related to wall bounce?

A. Yes.

Q. Would you go on to Exhibit 23-158 and tell us what, if anything, relates to wall bounce on that page?

A. Well, from the words at the top of this page, it appears that intentionally or otherwise, the ball would go below the bottom wall and then reappear with the automatic serve feature. Whether this was a defect or something that we were trying to do, I can't really tell.

Q. Can you tell from the entry on the bottom?

A. It still seems to be related to wall bounce in that it still seems to be tied in to trying to get a better integrator to serve the function on page 18

of Exhibit 19. Apparently integrator drift was causing the problem at that time.

Q. Can you tell from these entries whether Mr. Harrison's implementation was simply of a left and right edge bounce?

A. This page implies that it was all four.

Q. What on the page leads to that implication?

A. On the top portion of the page there is a statement "output of vertical integrator." The comments on the bottom of the page are talking about the right side of the screen and then the comment, works for one side of screen, but worsens the problem on the other, implying that that work was associated with the sides of the screen.

Q. Can you tell from these pages of Mr. Harrison's notes which you have been discussing this morning whether he was dealing simply with the problem of a ball bouncing off the edges of the screen or whether that concept was being incorporated into other circuitry which included the paddles and bounce off the paddles?

A. This is specifically Mr. Harrison's exhibits you are talking about or including mine, too?

- Q. Well, the question was specifically Mr. Harrison's.
- A. I think that it is directed at both functions.
- Q. You are referring to Mr. Harrison's notes pages 23-151?
- A. Yes.
- Q. To 23-159?
- A. I am looking specifically back at 23-151 and I did take the liberty of referring back to page 18 of Exhibit 19 even though you asked me specifically for Mr. Harrison's. On this Exhibit 23-151, there is a phrase in the middle of the page, "paddle ball coincidence pulse." And that also appears on page 18 of Exhibit 19 as there is a small arrow or rather two small arrows: one going to the horizontal flipflop and another to the vertical flipflop. Only one of them is labeled, but it does say spot coincidence. That I believe has to do with bounce from the paddle as contrasted to the right-hand arrow going to the horizontal flipflop which says <sup>hits</sup> <sup>WR</sup> minus 1 if it is side walls.
- Q. Now, the notes of Mr. Harrison which you have been referring to are dated from 12-11-67, the date of your notebook entry on page 18 of Exhibit 19, until December 21, '67, of Exhibit 23-159; did you

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do anything with respect to wall bounce either alone or with a paddle from December 11, '67, until December 21, '67?

A. Yes.

Q. What did you do and when did that occur?

A. I naturally can't remember just what I did on those dates so many years ago, but I am quite sure I was working along on that problem trying to get a successful implementation. I do see in Exhibit 19 on page 22, which is still dated 12-11-67, that I was working on bounce from paddle and wall as the title shows. I don't come across other entries in the notebook that show this, but I am pretty sure I was still in that room there involved with trying to get a successful implementation of these two features.

MR. WELSH: This might be a good time to break for lunch.

(Whereupon, the luncheon recess was taken.)

Q. (By Mr. Welsh) Referring now to Exhibit 23-159, did that relate to implementation of the wall bounce

feature?

A. I think so, but I am not sure.

Q. On what basis do you think that it does relate to that?

A. I see an integrator in the middle of the page and whereas this particular exhibit is in with all the rest of these having to do with integrators, I would think it might still be involved with that.

Q. Referring to the next four pages, 160, 161, 162 and 163 of Exhibit 23, all of those exhibits bear a date December 22, 1967; do you know what is depicted on those sheets?

A. Well, at least partially.

Q. Referring to first Exhibit 23-160, what is shown on that?

A. It looks like a provision for generating three dots and a method for coupling in the rifle game.

The modulator and transmitter indicates provisions for connecting this circuitry to a television set.

I see boxes labeled joy stick and integrators which is a method of controlling the position of the

dots. I see the gated differentiators and

integrators which are probably connected with some

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kind of bouncing action, and coincidence detectors.

Q. What relationship does this circuit diagram have to your concepts?

A. As far as the dot generation goes, I can't really tell from this exhibit. It depends what is inside those squares marked dot generators. That may or may not be the slicing-type method I had for generating dots. If the function of the differentiator and integrator was the same as on page 18 of Exhibit 19, then that would be related to an attempt to implement wall bounce.

Q. Do you recognize that drawing, Exhibit 23-160?

A. Not from memory of 1967, no. I seem to recognize it now. It looks like Bill Harrison's writing since it is in within <sup>WR</sup> his collection of papers.

Q. Referring to Exhibits 23-161, 162 and 163, do they have any relation to the block diagram of Exhibit 23-160?

A. I would say yes.

Q. What is that relationship? You are looking now at Exhibit 23-161?

A. Yes, Exhibit 23-161 appears to be circuitry schematic information representing at least some and possibly

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all of the functions shown on the block diagram 23-160. Going back to one of the previous questions, this flipflop at the upper left-hand corner or rather the sawtooth generator, does appear to be one of those that I invented and the middle section of this exhibit seems to be the diode type slicing method that we talked about before.

Q. That is the entire middle section?

A. Yes.

Q. Anything else?

A. You mean whereby this circuitry represents the block diagram?

Q. Is related to the block diagram, yes.

A. In the lower right-hand corner, circuitry labeled chroma generator which seems to be related to the block, the block diagram marked chroma generator.

Q. Anything else in any of Exhibits 23-161, 162 and 163 that is related to 23-160?

A. The lower left of 23-161 seems to be the modulator and transmitter circuitry and the integrators of 23-161 going to two boxes labeled joy sticks which seem to correspond to the boxes labeled joy sticks and integrators on Exhibit 23-160.

Q. Now, where are the integrators on 161?

A. The circuitry involving two cascaded 2H5133 translators. There are four such circuits shown.

Q. Are these the circuits just to the right of the dotted rectangles that bear the legend joy stick?

A. Yes. On Exhibit 23-162 at the bottom, the circuit labeled rifle electronics which seems to be related to the block diagram. I think Exhibit 23-163 is related at least in the upper left and top middle. It looks like there are gate provisions for passing plus and minus polarity voltages. I think this would be associated with the boxes on the block diagram marked gated differentiator and integrator. I partially base this on the letters X Y and X prime and Y prime which may signify differentiated voltages, although I am not sure of this.

Q. Do you know if the circuitry in the upper right-hand portion and the middle right portion of Exhibit 23-161 is?

A. I think the one in the upper right is the one shot multi of 23-160. And just based on the block diagram which shows the input of the multies coming from coincidence detectors and trigger.



generators, that that is probably what the second circuit from the top of the right-hand side of Exhibit 23-161 involves.

Q. You say probably, you are not sure, then, I take it?

A. I would say reasonably sure, but not 100 percent. I do see in that second circuit from the top, it looks like inputs labeled D, E and F which I would think would correspond to inputs labeled dot 1, dot 2 and dot 3 of Exhibit 23-160.

Q. There are not corresponding letters, however, on Exhibit 160?

A. I believe that, for example, dot 1 is similar to the letter D; dot 2 is similar to E and dot 3 is similar to F in that in the next circuit below we see D repeated again just as on the block diagram we see dot 1 repeated twice. Also there is a switch on both diagrams associated with dot 3 and letter F.

Q. You said dot 1 appears twice?

A. Yes.

Q. Where is that?

A. On Exhibit 23-160 it is shown entering No. 1 coincidence detector and trigger generator and

also entering No. 2 coincidence detector and trigger generator.

Q. Do you know what is the bottom-most circuit of the three at the top on the right of 23-161?

A. You are saying the third from the top?

Q. Yes.

A. With an input labeled D?

Q. Yes.

A. I believe that would correspond to No. 2 coincidence detector and trigger generator of Exhibit 23-160.

Q. And the one above it corresponds to No. 1 coincidence detector and trigger generator?

A. Yes, I believe so.

Q. Now, what do the one-shot multivibrators do?

A. I don't really remember. I could say from looking at the diagram of 23-160 that they provide some kind of input to the generated differentiators and integrators as shown by the line with the arrow.

Q. With respect to Exhibit 23-163, you identified parts in the upper left top middle, could you identify any of the other circuitry on that page?

A. The circuitry at the lower left based around two 2N 5133 transistors appear to be a flipflop of

some sort. Whatever its function, there seems to be another one at the right of that exhibit. At the bottom I see a circuit labeled auto serv for handball which apparently implements what we have talked about previously in that area. The circuit at the upper right-hand corner may be part of the gated integrator. The <sup>2N</sup> ~~2N~~ 2N5133 transistors at the left of that portion looked like they may be gates. And the .01 microfarad capacitor in the circuitry in the upper right looks like it may be an integrating capacitor.

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letter

Q. What was the value of that capacitor?

A. .01 microfarads. The microfarad is not shown.

Q. Referring to Exhibit 23-162, other than the rifle circuit at the bottom, can you identify the other circuits?

A. The two circuits at the right may be some kind of one-shot multies, probably the same ones shown on 23-160. The two circuits at the left of the page at least seem to have as inputs the horizontal and vertical voltages associated with two spots which are probably referred to as paddles in that the letter B is used. I would imagine that the outputs

of those two circuits labeled Hd and Vd would be voltages controlling a third spot, but I am not exactly sure just what is going on here in these circuits.

Q. That was going to be my next question, do you know how these circuits work?

A. It is possible that these are related to the so-called English control, but I am not sure. I say it is possible; I see X and Y voltages fed through 100K resistors to the base of transistors at the left of the circuits, so they must somehow either pass or short to ground the voltages labeled P1H, etc., through P2V.

Q. Do you know if these drawings represent implementation of your concepts?

A. At least partially, yes. We covered the sawtooth generators of Exhibit 23-161 which I think are the ones I later got a patent on. I would definitely believe the middle portion of that exhibit shows the diode slicers required to generate three spots in accordance with my method of diode slicing.

Q. Anything else?

A. I see the joy stick and integrators. I don't remember now whether that was one of my ideas or not; it may have been; because I can't really remember the function of these 1 shot multies, so I can't really remember whether I was implementing one of my ideas or not.

Q. Do you know whether these diagrams include circuitry for producing wall bounce?

A. I am not sure. If they do, it would be at least partially through the blocks labeled gated differentiator and integrator of Exhibit 23-160, which may correspond to the differentiator gates and integrators of page 18 of Exhibit 19. I think that some of this circuitry in 23-163 possibly does correspond to some of the blocks on page 18 of Exhibit 19 and those two flipflops I referred to previously, I wasn't sure of their function, may be the horizontal and vertical flipflops as shown on page 18 of Exhibit 19.

Q. Of which were those flipflops?

A. These based on the 2N5133 transistors.

Q. On the bottom left and right of Exhibit 23-163?

A. Yes. If that is the case, or I say that because it

looks like the outputs of those flipflops go to gating transistors which in this case are shown as gates which would short a signal to ground to reject it and when that is being done with one signal, the other would get through and I think that does correspond to the function of the flipflops and the plus and minus ones shown on page 18 of Exhibit 19.

Q. Do you know whether there is any wall image generated in these circuits?

A. I don't know for sure, but based on what I just said, if that is true, I would be led to say I believe this doesn't implement wall bounce in that it does seem to correspond to page 18 of Exhibit 19.

Q. And, when you say wall bounce there, I take it you mean with or without a generator for an image of the wall?

A. Yes.

Q. Do you find any wall image generator?

A. Any wall image generator?

Q. Yes.

A. I don't think so. I would like to add that this bounce from an image or from the wall could be

*circuits require with 51022*

done using this same circuitry whether an actual image was generated or not. It is sort of like if there is a property line between two houses and one of the property owners has a horse, that the property line itself won't keep the horse from crossing over into the neighbor's property, but if you put an electric fence there, the fence will do that job. The circuitry I have been talking about is like that electric fence. This isn't a very good analogy, but I am trying to explain what I mean.

Q. In what way, in that when a ball image reaches the fence, it reverses direction?

A. Yes.

Q. What is the fence, the edge of the screen or an image on a screen?

A. Yes. Suppose you were trying to keep the horse from hitting a garden that is 5 feet in from the property line, you would have that fence in 5 feet <sup>wr</sup> ~~in~~ from the property line and that would keep the horse from hitting the garden even though the garden wasn't involved in it as such.

Q. Referring to Exhibit 163 and the legend auto serve

*clarity, misquote wr 5/25/76*



dot handball, do you recall how handball was intended to appear to a player at this time of December 27, 1967?

A. I don't recall, perhaps I could figure it out from these diagrams we have been looking at. I would think that it involved wall bounce from at least one wall. For example, the top wall, and probably from the two side walls as well. The two paddles or in this case players would be at the lower portion of the screen and this automatic serve would probably make the spot appear from off screen at the bottom in which case it would be heading up and on to the sides. It would bounce from either just the top or the top and the two sides and head back towards the players, in which case one player whose turn it was would attempt to intercept that spot with his playing spot. If he hit it, it would bounce back up toward the top wall. That is my concept, I am not sure whether that coincided exactly with the date you mentioned.

Q. Have you ever seen here at Sanders hand ball played on a CRT with the characteristics you just described?

- A. I am quite positive that that was one of the games that was implemented and that I did see that.
- Q. With the bounce off of the top at least and possibly the two sides?
- A. I believe so, yes.
- Q. Have you ever seen a handball game played with just a vertical wall image to the left of the screen?
- A. I may have; I don't remember for sure.
- Q. Do you have any recollection of it?
- A. A very vague one in the back of my mind, but I wouldn't bet on it.
- Q. But you are positive that you have seen a handball game with bounce at least off of the top edge of the screen?
- A. After nine years, I am not 100 percent positive of a lot of this, but I do sincerely believe I did see that, yes.
- Q. Do you know why these circuit diagrams were made? That is, Exhibits 23-160, 161, 162 and 163?
- A. Do I know why they were made?
- Q. Yes.
- A. I think to have the circuitry both for the

possibility of things like this and for other reasons such as if we wanted to duplicate more of the circuitry, it is easier to do it from a schematic than it is from looking at a bread board.

Q. Do you know whether these circuits were actually constructed?

A. I definitely believe they were.

Q. Do you know whether an entire apparatus incorporating all of these circuits shown here was actually constructed?

A. I believe it was. At least I know we had spots and paddles and things like that doing many of the functions that we were trying to do at the time which we have been discussing and I saw this happen and was a part of it, so for most of it I do know there was circuitry which not only was built, but it worked.

Q. Do you know whether the entire circuitry depicted in these exhibits was constructed as a single unit?

A. In all these exhibits that we have been talking about?

Q. No, just the ones that we have been discussing

lately, 23-160 to 23-163.

A. I don't know if all of them were constructed in a single unit or as separate bread boards which were interconnected together to form a total unit. I definitely know this slicing arrangement shown on 23-161, for example, was constructed and worked together with the flipflops. I am quite sure everything shown on that page at least, I would think from the way these circuits are drawn, that they are more or less final records of circuitry that had been built and worked as opposed to some of our earlier work where things might not have worked quite right and we would continue until they did.

Q. Do you know if apparatus that was constructed in accordance with these circuit diagrams, Exhibits 23-160 through 163 was demonstrated to anyone outside of Sanders Associates?

A. That I don't know.

Q. Are you aware of any demonstration of any TV game apparatus to TelePrompster Corporation?

A. I may have heard of that. I guess I am not supposed to ask questions.

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MR. WILLIAMS: If you don't think the question is clear or you don't understand the question, you can ask for a clarification.

THE WITNESS: I will just say I may have been told that; I don't remember for sure.

Q. Did you participate in any demonstration of any TV game apparatus to TelePrompter?

A. I don't remember. I think I participated in one demonstration, I think it was with the Cable TV people and I don't remember if they were named TelePrompter or not.

Q. Do you recall when that was?

A. Not really. I believe it was during the period we established that I worked for Mr. Baer.

Q. With respect to the demonstration to Cable TV people which you may remember, what was demonstrated?

A. I am not sure, I seem to remember some of the maze games. I am also not sure of whether I was present at the actual demonstration or not.

I seem to remember being in a screen room at Canal Street one night with Mr. Baer and Mr. Harrison, helping in a small way to get ready for the

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demonstration.

Q. Do you remember the apparatus that was involved in the demonstration?

A. Not specifically, no. You know, as which version, whether it was bread boards or a finished box or things like that or even exactly which functions were demonstrated. I don't know if it is real recall or just an assumption, it seems that the rifle game and quite probably the ping pong game, but I am just not sure.

Q. Do you have any recollection of the apparatus?

A. I don't know if it is a real recollection or having seen some of these boxes here on display as exhibits, the ones covered with the wood grained paper, jogged my memory a little bit.

Q. Could you examine the models that are here and see if you can pick out any that were involved with that cable television demonstration?

A. Not with any real certainty. I will say, for example, this Exhibit 35A, the rifle, that may have been involved in the demonstration, but I do remember that there were other rifles. I see another one over here which is called - I don't

see an exhibit number on it, but it is another rifle. That may have been used. I can't really remember which or for sure if any of them were involved.

Q. Is any of this apparatus here which has been marked as Exhibit 30 familiar to you?

MR. WILLIAMS: I object to the question, let's get it out and show it to him.

THE WITNESS: I'd say at least these three boards containing potentiometers bring back memories. I think that the tapes fastened on these boards contain letters which I wrote. It looks familiar to me as if it were my handwriting. I can't really say that this box to which these potentiometers are connected with wires - - -

Q. Marked Exhibit 30?

A. Yes. I can't really say that that is familiar enough that if I didn't see it here connected to those things with wires, that I would remember it.

Q. But you do remember the potentiometers that you referred to earlier?

A. Yes, I seem to remember that. Perhaps jogged by this tape which I think contains my writing,

*Notes: Not sure whether this is or this is not the same as the one in the box 3725476*



Q. What are the legends that are on the tapes that are in your handwriting? ~~OK WLR~~

A. One is a Vr, another is H1 right and a V1. On the other board there is a V1 and an H2 left and a V2, which I think is in my writing.

Q. Was there a third board?

A. Yes. I think the label on that third board is my writing, too, I am not sure of that. Some portion of it has been crossed out. R's are replaced with L's as we apparently had wires inadvertently connected to the wrong places and things like that. I think that is my writing, too.

Q. And what are the legends on the third board?

A. It looks like it ended up that the left writing is H1 and the right-hand side says Hn.

Q. All right; now, I will show you what has been marked previously as Exhibit 35 which consists of this larger box with the walnut grain covering and bearing a piece of masking tape with the Exhibit No. 35 on it plus two smaller boxes connected by wires to the larger one plus a rifle, a toy rifle marked as Exhibit 35A, and I ask if those are familiar to you?

~~NOTE: Not sure whether they're H's or H's~~  
OK. WLR 5/25/76 ~~check exhibit.~~ WLR 5/25/76

- A. I think at least this rifle is. I seem to remember this little red reset button on it and I do remember Bill getting in a plastic rifle which he modified. I am not sure if it was this one or another one here or both of them. Probably both. The boxes do appear to be equipment which was used to demonstrate some of these various devices.
- Q. Do you recall that equipment being used with any particular demonstration? This is Exhibit 35 and Exhibit 35A?
- A. I don't recall. As I say, I am not even sure I was at that CATV demonstration. I do remember, as I say, at least partially participating in getting ready for it. Probably the night before it happened, and I can't really recall whether this was the particular equipment used for it or not.
- Q. How about the other equipment, Exhibit 30, do you recall whether - that is the equipment over here that bore tapes with your handwriting.
- A. I can't really at this time remember which of these was used.
- Q. Can you tell from examining Exhibit 30 with the legends which you wrote what types of games it was

possible to play using that apparatus?

A. Not really with any kind of accuracy.

Q. Do the legends mean anything to you?

A. On the longer boards, I think the subscripts 1 and 2 probably refer to two spots. The V's refer probably to vertical position. I don't really remember what is signified by the remaining letters and the ones on that third or smaller board.

Q. The H1 and the Hr?

A. Yes, and the V1 and Vr.

Q. Those aren't on the smaller board?

A. No, just H1 and Hr on the smaller board and Vr and V1, one of each on the longer boards. I would think that those are the positioning voltages for a third spot, but I am not sure.

Q. Might the V1 and Vr be an English control?

A. Yes, they might be.

Q. You have no recollection more specific than that?

A. Not really. I could offer assumptions, but that is all they would be.

Q. You don't have any idea?

A. It is possible that this could be a version of the ping pong game where the H1 and H2 would set the

horizontal positions of the two spots or the two paddles and as we said before, in normal operation, they wouldn't be touched during a game. And, if that assumption is true, then the V1 and the V2 would move the paddles up and down and as you offered as a possibility, this Vr and V1 may have been English controls. Without taking a real long time to try to figure out what is inside this box they are attached to, I can't say for sure. It is possible even after I did that, that I couldn't say for sure, which is why we made the schematics that you asked me about before.

Q: Are those schematics, Exhibits 23-160, the block diagram, through 23-163, representative of what is in this model?

A. That would take some time to find out. I would have to examine this box against those schematics piece by piece to find out.

Q. Does the red button on the board closest to you with the potentiometers on it have any significance or help you determine what games were intended to be played using Exhibit 30?

A. It looks like some sort of a reset button to me and

without a thorough examination, I can only say it might have been used to reset the rifle game or to manually serve a ball in the ping pong game or a hand ball game, things like that, or it may be for something entirely different which I have forgotten about. I do see on this box the words "ping" and it looks like rifle.

Q. You don't recall those legends?

A. Not specifically, no.

Q. They don't help you recall whether you have seen this apparatus before with the legends in your handwriting?

A. Not really. I don't see anything on that box itself which looks like it is my handwriting and except for the fact that this box is connected to these boards and the potentiometers, I can't recall. It is not that exceptional a box. Where it is in context here, it is connected to these things, I would assume that I had seen it and probably used it.

Q. The box does have a plate attached to it projected out from an edge with switches on it; that is an unusual characteristic of a box, is it not?

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- A. Yes, I suppose you could say that.
- Q. That doesn't help you recall the apparatus?
- A. Not that edge, no, not really.
- Q. Anything else in your examining of the apparatus?
- A. Not really. I have seen probably hundreds or thousands of things that look similar to this since I started working in electronics.
- Q. Do I understand correctly, then, that you don't remember either of these exhibits as having been involved with the CATV demonstration?
- A. To try to make it clear, I think I should say that I do not remember definitely <sup>theirs</sup> ~~there~~ <sub>(their)</sub> not being used, but I can't remember exactly whether or not they were used.
- Q. In other words, you can't identify either one of them as having been used?
- A. That is probably correct.
- Q. You don't remember what games were involved in the demonstration?
- A. Not really because, as I say, I can't even remember if I was at the actual demonstration or not; so if I wasn't at the demonstration, of course, there is no way that I could remember what games were

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demonstrated at it.

Q. And you don't remember what games were possible with the apparatus that you might have prepared for the demonstration?

A. As I say, I can't remember when that demonstration happened, so I can't really refer to these exhibits to see what we had evolved by that time, but I think I did say before, I seem to remember the rifle game being in existence at that time and probably the ping pong game and some of these maze games.

Q. When you say the ping pong game, you mean the ping pong game with a ball image and two paddle images with the ball bouncing only off of either of the paddle images?

A. Yes. I don't know if the wall bounce feature was demonstrated or ready at the time of that particular demonstration or not.

Q. Do you know if the wall bounce feature were ever demonstrated by Sanders to anybody outside of the company?

A. I don't know. As I say, other than this CATV demonstration which I helped prepare for the night



before, I don't remember really being involved in any of the other demonstrations. I did hear about some of them probably through Bill Harrison, maybe Ralph, but I wasn't really personally involved in that part.

Q. Were you aware of a demonstration to RCA?

A. I remember hearing about it, yes.

Q. Were you still working on the TV game project when you heard about it?

A. I don't remember.

Q. Did you have anything to do with any demonstration to any personnel of RCA or representatives of RCA?

A. No, I don't think so.

Q. Do you know what apparatus was demonstrated to RCA?

A. No.

Q. Are you the William T. Rusch who was named as sole inventor of U. S. Patent No. 3,659,284?

A. Yes.

Q. And are you the William T. Rusch who is named as inventor of Reissue Patent No. 28,507 which is a reissue of the 284 patent?

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A. Yes.

Q. Are you familiar with the subject matter of those patents?

A. Yes, I was at one time much more familiar with it than I am right now, but I would say yes.

73  
Q. How did you become familiar with that subject matter?

A. Well, one way was reading the patents.

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Q. When?

A. I don't know exactly, sometime after they were issued.

Q. Both of them?

A. I believe so.

Q. Now, the reissue patent just issued last August, did you read it after that date?

A. I guess not, I stand corrected.

Q. Did you have anything to do with the preparation of the application for the 284 patent?

A. Yes.

Q. What did you have to do in that regard?

A. I believe I wrote up a fairly detailed description of the methods described in that patent for the Legal Department of Sanders Associates, Incorporated.

Q. I hand you a portion of a file which was produced in this litigation on behalf of Sanders, a file marked D-2580, which has been identified as the Patent Department file or part of it, at least, for the application for the Patent No. 3,659,284, and ask if this 27-page document which has a cover sheet entitled "The Attached Document Contains Company Private Data," is the write-up to which you just referred?

A. I didn't check all those numbers you just said, but I trust that they were correct and I do have this document you handed me. I believe that is the document or at least one of them we are talking about. I do recognize as my own handwriting and drawing a page called Figure 1 at the back of that.

Q. What page number does that bear?

A. 19; and Figure 2 on page 20 I recognize as mine. Figure 3, page 21, Figure 4 on page 22, Figure 5 on page 23, Figure 6 on page 24, Figure 7 on page 25, and Figures 8 and 9 on page 26, and Figures 10 and 11 on page 27.

Q. I now hand you what has been marked in Mr. Baer's deposition as Exhibit 9-197 through 9-223 and ask

if you would compare these pages with those that you just examined and tell us if except for the legend "company private data" which appears on the pages of the original document, if Exhibits 9-197 and so on are a true copy of the other item?

MR. WELSH: Mr. Williams, would you mind if we marked the original or can we just stipulate that the other is the same? It appears to be a true copy.

MR. WILLIAMS: Perhaps it would be more appropriate to take the original and make a copy of it and mark it. I haven't compared the two.

MR. WELSH: If you don't mind doing that, then that would be satisfactory with me. You don't wish to have the original marked as an exhibit?

MR. WILLIAMS: I would just as soon keep this file intact. This is an important file to Sanders. There is already problems with it. On page 1, Exhibit 9-197, there is entries on it that aren't on the original and I can see that No. 2580 entered in the box up in the right-hand

corner is in different handwriting. On 9-197,  
it says D-2580 and on the original it says just  
2580. I think we should take the original and make  
a copy.

MR. WELSH: You furnished us  
with a copy and I take it you have one, too?

MR. WILLIAMS: Yes.

MR. WELSH: Would you produce  
that now?

MR. WILLIAMS: I don't have  
it in the room, it is upstairs; I could go get  
it.

MR. WELSH: Off the record.

(Discussion off the record.)

MR. WELSH: Let's mark this  
document which was furnished to us as a copy of  
the original document which the witness just  
referred to as Exhibit 46.

(Whereupon, Exhibit No. 46

was marked for  
identification.)

Q. I hand you now what has been marked as Exhibit 46 and ask if you would please identify that for the record?

A. As to whether it is a true copy of this other thing we were talking about?

Q. No, just what is the document?

A. Well, it appears to be a patent disclosure sheet submitted by me to the patent counsel of Sanders Associates, Incorporated. It is apparently a copy in that it does not look like an original.

Q. A Xerox copy?

A. Whether it is a true copy or not, I am not sure, but, yes, it looks like a Xerox copy.

Q. Well, would you compare it with the original and advise me if it is a true copy? \* WR

A. This original being this thing with the red "company private data" page on the front?

Q. And from which you testified that pages 19 through 27 were actually prepared by you.

A. Yes. And I believe the other pages 2, although being typed, I can't see if they are in my handwriting, actually. How detailed do you want the comparison? Down to every word; and, if so, may

\* Think this a misquote Check exhibit for correct wording 5/25/76

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my counsel here help me?

MR. WILLIAMS: On the representation that Exhibit 46 is actually a copy which we supplied you, we will stipulate that it is a true copy of a document in the file subject to any correction for matters such as missing pages or anything.

MR. WELSH: Fine, then it won't be necessary to do that.

Q. Now, what does this exhibit contain by way of information? You described it as a patent disclosure.

A. Well, its title says TV gaming device - new system. Under problems solved, it says, "Provides another position and method <sup>\* WR</sup> for spots on TV screen. Voltage control permits new functions and applications." Under how the problem is solved, it is stated, "Vertical and horizontal sawtooth wave forms are sliced and differentiated. Slice voltage level varies delay and position."

Q. Without your reading the document, do you recall preparing it? I mean, without reading it word for word as you have been doing?

\* Think this a misquote. Check exhibit for correct wording WRD 5/25/76



A. I think so, yes.

Q. And what was the occasion of your preparing the document?

A. Well, this new method of electronically controlling spot position and the diode slicing, things that are described herein had been proven out by hardware which worked and did the things which we were trying to do and it seemed the smart thing to document this and get it into the Patent Department to try to apply for a patent.

Q. Does this contain everything which you consider to have been your contribution to the TV game project?

MR. WILLIAMS: If you recall, Mr. Rusch. Don't hesitate to thoroughly examine the document.

A. I think not, if I understand your question correctly.

Q. Does it include something which you do not consider your contribution to the <sup>4</sup>TV gaming project?

A. No, if I understood your question to be, Was this document or rather did this one document contain all the ideas I submitted in the TV gaming project? I don't believe this one document did include all the ideas.

Q. Are all of the ideas which are included there your ideas?

A. Well, I think so. I haven't examined this page by page.

Q. Would you do that, please?

A. In starting to answer this question, I see on page 3 that I did note at that time that Ralph Baer had thought of many associated ideas in this general field and I tried then and I still do to give him a lot of credit for initiating the whole thing and I say on this page 3 that a working system was constructed and demonstrated and a patent application initiated, so I wasn't then and I am not now trying to claim any credit for the things that had been done up to that time. From that point, the document says, "Since that time a new and different method of generating spots and patterns has been invented, built and demonstrated." *u/r*

Q. At this point, could you summarize what you consider Mr. Baer had done prior to your inventing the new and different method of generating the spots and patterns? *as hit. As far as that was concerned was*

A. Yes, I think so, or at least a large part of it's

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I think there was provision for square spots, one or more, which could be controlled in position by manually rotating a potentiometer shaft or shafts. I think the rifle game was in existence then with some kind of an indication of when a spot was hit by the rifle being aimed at it correctly. I think those are the main functions I can remember as being in existence at that time.

Q. You say one or more spots or square spots, were there more than two?

A. I am not sure.

Q. Well, prior to your work, was coincidence of two spots detectable in the circuitry that had been developed? wouldn't it?

A. I think so, but I am not sure just going on memory.

Q. Do you recall what happened upon the coincidence of two spots?

A. I am not sure of that part of it. I seem to remember at least in the rifle game which is not coincidence as you have defined, but I seem to remember the screen color changing and/or the spot disappearing when it was hit. As far as just what happened when two spots hit, I don't really recall whether this

same thing happened or not. That that was the case.

Q. What do you mean this same thing?

A. Well, the screen color changing and one or both of the spots disappearing.

Q. Do you consider that you were the first to provide circuitry for detection of coincidence of two spots? It didn't exist, but I just don't remember.

A. I am not sure of that; I don't remember.

Q. You might have been? Or that's right?

A. It is possible. If it didn't exist when I got on the program, it is possible I contributed that, but, as I say, I vaguely recollect it being in existence when I got there, in which case it naturally wouldn't have been my idea.

Q. Now, when I asked you before generally what you felt you contributed to the TV game project, I don't believe you listed detection of coincidence of two spots as one of the things you contributed, is that correct?

A. It doesn't register near as strongly in my memory as, for instance, this electronic control and the differentiating, etc., associated with wall bounce or the ping pong game or like that, so I just can't

sit here and say definitely that that was my idea.

It is quite possible that it was not.

Q. But you can't say definitely that it was not either?

A. Not strictly from memory. As I say, this was nine years ago and I can't recall exactly what they had when I got on that program. I am not saying, it didn't exist, but I just don't remember.

Q. They were generating spots on the screen of a TV receiver, however, were they not?

A. Yes, definitely.

Q. And at least two spots?

A. I think so. At least one and quite possibly two or three.

Q. You don't remember whether there were more than one? I believe you just said that there were.

A. I think there were at least two.

Q. Well, going on now with respect to Exhibit 46 and the question of whether what is described there was considered by you to be a contribution to the TV game project, would you go ahead and point out anything that is not, that you do not consider to have been your contribution?

A. Well, I have covered this part in the introduction

where I tried to give Ralph credit for what I knew he had done. One indication I have on this subject is on page 3 where it says additional applications (games) some of which are made possible by the new system concept and some, common to both systems, which may not have been covered previously. Now, I think I meant by that - well, just what it says, that there apparently were some new games that had been thought up which could have been played with the existing square spot system, if you will, and which could also be played on this new system involving the electronic - well, not the electronic control, but involving the slicing thing and apparently I tried to cover them in this particular memo to the Patent Department. Under basic theory on page 3, it says that on a real basic foundation, a lot of the circuitry is similar in the old and new systems in that an electron beam is moved and in the case of a TV set, it scans at the normal times that are shown herein. And the blanking of a beam during fly-back, things like that, which are common <sup>WR</sup> to many systems. I don't claim that that was my idea. I'd say a lot of the stuff on

\* check a bit for correct wording, 10/25/76  
Spelling ref 5-25-76

page 4 under video signals for spot generation was not really my idea, but rather an attempt to give a full description of the overall process to help the Sanders Legal Department construct a good patent application. We probably get into my ideas on page 5 under Item 3, New System Concept. It mentioned the voltage control and the fact that the sawtooth is sliced.

Q . Before you go on to the next - to page 6, Section C of Roman Numeral II appears to state, "Of note is the OR gate whose output is the final video signal. This OR gate is required simply to avoid excessive spot ~~e~~ brightening<sup>if</sup> two spots fall on top of each other." Was that old in the prior system, so far as you know?

\* w2

A. Yes, I believe so from looking at Figure 2. And by old, I mean probably in existence on the version of this thing that existed when I got on the project.

Q. Now, you were going onto the new system concept.

A. Yes, I think I started and covered page 5. And that talks some more about generating the spots using the sliced portion of the ramp wave form.

I am still trying to answer your original question

\* check exhibit for exact wording. w2 5/25/76



of what in here was not my idea. You having brought my attention to this OR gate, I would think that that might not have been an original idea, but was just incorporated in here describing the new working system using that as a building block. I would say the fact that the spot came up round as discussed on page 6 was definitely at least a result of my new system here. I am not sure I anticipated it happening, but it did and was a different feature. I am still looking for things that were not my ideas. Well, I see a reference in the text to Figure 3 and looking at that figure I see horizontal and vertical sync pulses being generated to go to the TV set and things like that, you know, which most TV sets require, I don't claim that was my idea, but this particular way of generating them out of these two sawtooth generators probably was my idea. I think on page 8 where reference is made to a summer and RF oscillator as indicated in Figure 2, that that portion of the circuitry existed. Also on page 8 there is reference to a photo sensor extracting 60-cycle sync from the front of a TV screen. I don't remember now for sure whether that



was my idea or something. Bill Harrison found out or perhaps Ralph Baer. On page 9 where it talks about generation of voltages, Ehl and Evl coming from the sliders of potentiometers are still part of my idea. I thought that sentence might have referred to just plain potentiometer control. For example, if you look at Figure 6, you see that those two voltages do go back to the diodes and therefore are an integral part of this voltage positioning. I see on page 10 the sentence at the bottom, "Recently, backgrounds (rather than overlays) have been used." I don't recall whether it was my idea to try backgrounds or how that came about. It may have been, I don't remember. I think the idea that is referred to in that Item 6 of the hollow ring was either my idea or fortuitous advantage that accrued thereby. Item 7 on page 11, talking about the Lissajous patterns. I don't claim to have invented Lissajous patterns. Item 9, the negative video; for example, to make a spot appear black, may not have been my idea. When I say under Item 10 on page 11, "spot coincidence," I am not sure whether that was my idea or I just included it.

in here for completeness.

Q. I believe earlier you testified that you weren't sure that that had been done before.

A. That I was not sure? <sup>we</sup>

Q. Right.

A. That is correct; but I am also not sure that it had not been done.

Q. Now, that was referring to the disappearance of the spots upon detection of coincidence?

MR. WILLIAMS: What do you mean by that?

MR. WELSH: That he wasn't sure of whether he thought of it or not.

THE WITNESS: I was referring more to the generation of the coincidence signal rather than to what was done with it after it was obtained.

Q. You did consider it to be your idea, did you not, to use the coincidence signal to make one spot bounce from another one hit?

A. Yes, I consider that my idea.

Q. And the same thing is true of Item No. 8 on page 11, ball bounce from the sides of the screen

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which you also called wall bounce?

- A. Yes, I believe that was my idea, as I said before. Under Item 11 on page 11, I don't know if generating these black and white columns was my idea, <sup>we</sup> or later on the horizontal bars. I think I thought at least at the time that this checkerboard pattern was my idea. Under Item 12, the pumping action, I seem to remember that Mr. Baer had some kind of a game, something on that order, and, as we said earlier here in this deposition, and seeing that box over there with the wooden arm on it jogged my memory a bit. I think there was some kind of a provision for manually moving a spot or lengthening a column or something like that with a pumping action. I see I extrapolated that into a target-shooting game and I think that extrapolation was my idea, but I am not sure after all these years. On page 12, even-odd spot discernment. I remember quite clearly that the desire to perform this function was Mr. Baer's which he presented to me as a problem to solve. I rather vividly recall that the solution to it was my idea. I am still trying to find mostly what was not my idea and when I come

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to ones that were -- --, there is some kind of

Q. I understand, and the things that you don't mention are considered to be your ideas?

A. Yes. At the bottom of page 13, I think we are talking about this so-called English control used in the ping pong game and the fact that a spot could have been moved up and down or right and left by manually adjusting a potentiometer was not necessarily new to this thing. The fact that the voltage went to the diode slicers made the implementation slightly different. I do think the whole idea of using the English in the ping pong game was mine. Rather, tritely on page 14, the use of overlays was not really my idea. Some of the particular ones were later on, but I think Ralph had been using some kind of overlays prior to this time. In the first or the second paragraph

Q. You are speaking of overlays as it appears on line 4 on page 14? Is that?

A. Yes. In this gun ping pong on page 14, the idea of using a gun to aim at a spot on the TV set was not mine, that had been in existence, as I remember. I think this particular game described was my idea.

WR

I don't know if it matters, there is some kind of writing on page 14 which doesn't seem to have been mine. A detailed implementation, I think, is

Q. Can you read what it says?

A. It looks like it says, "No free running FF," is either pitches or pitchers," pushes button to flip FF." Now, the item at the top of page 15, I think the joy stick part of it was not my idea. I think there may have been one of them implemented. I believe the addition of the integrator to get what I called on page 15 as "a somewhat sluggish, spongy effect" was my idea. I think in this section we are in now is what I apparently referred to earlier in writing as possibly new games which could be implemented in either the old or the new systems. Some of them appear that way.

Specifically in the first or the second paragraph on page 15 where chase games are mentioned.

Q. You say that was an old idea?

A. That might have been, as I say, I can't recall for sure whether coincidence of the two spots existed. I think it might have, but I am not sure. On these latter pages I was looking mostly

WR

at the underline<sup>d</sup> titles of each section and I think most of them, if not all, were my ideas. Perhaps some of the detailed implementation, if any, as happened to be described, may have been possible with the earlier version.

spelling  
or misquote  
wp  
5/25/76

Q. At least you thought of doing the things that are set out here?

A. The games themselves, I believe so. For example, definitely that even-odd maze and the one under it, even-odd maze with jumps; cushion billiards, golf putting, bowling, I think most of them, to my recollection were my ideas.

Q. I now hand you what has been marked previously as Exhibit 9-130 through 9-173 and ask if you recognize it and, if you do, would you identify it for us, please?

A. This appears to be a copy of my original draft which later turned into Exhibit 46 and this other thing which we think is the original of Exhibit 46. Some of the pages in this Exhibit 9-30, etc., are in my handwriting. I see portions of it are typed. These pages appear to be similar to - well, the text seems similar - the latter documents must have

\* Busch  
5/28/76

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5/28/76



been retyped from this, I believe.

Q. Where there is handwriting in that 9-30 and on,  
is that your handwriting?

A. I haven't looked at every page, definitely a lot  
of it is my handwriting. The figures at the back  
are my handwriting and scanning this quickly, every  
handwritten page I come to seems to be in my  
handwriting, yes.

MR. WELSH: This might be a  
good place to stop for the day.

(Whereupon, the deposition in the above-entitled  
matter was adjourned at 5:05 p.m.)

*William T. Rusch\**  
Deponent 5/28/76

THE STATE OF NEW HAMPSHIRE)  
COUNTY OF Hillsborough) SS.

Subscribed and sworn to before me this 28  
day of May 19 76.

*This depo  
\* Corrected to  
extent shown by  
note Depo 8, p. 47*

*Virginia J. Murphy*  
Justice of the Peace and/or  
Notary Public

My Commission Expires September 26, 1979